

REMARKS

Claims 1 and 15 are amended to include the limitation "chip" before "resistor." This amendment is supported on p. 5, lines 28-33 of the specification. Claims 1 and 15 are amended to include the limitation "directly overlaying and attaching to." This amendment is supported in Figure 2.

Claim 1 was rejected under 35 U.S.C. § 103(a) as unpatentable over Minami et al. (U.S. 4,777,583). Applicants respectfully traverse this rejection. The office action stated that the invention is mostly disclosed by Minami et al., Fig. 2. Minami is directed towards a thermal head and not to a chip resistor. Because Minami is directed towards a thermal head, Minami requires a glaze layer.

Claim 1 is a method of manufacturing a thin film resistor. If the claim is followed, a three layer device is formed, from bottom to top: substrate/resistive layer/tantalum pentoxide. Minami, Figure 2, teaches a device that is from bottom to top: substrate/glaze layer/resistive layer/tantalum pentoxide or, starting from a different point, substrate/resistive layer/electrode/tantalum pentoxide. Minami does not teach the same layers in the same relationship to each other as the present application. In short, if the result of the processes is different, the processes must be different.

Amended claim 1 requires "depositing a non-tantalum metal film resistive layer directly overlaying and attaching to a thin film resistor substrate." Minami et al., Figure 2, teaches that a resistive layer directly overlays both an alumina ceramic substrate, and a glaze layer, in different places. The glaze layer is not present in the claimed invention, as the claimed invention is directed towards a chip resistor and not a thermal head, a very different result. Therefore, the limitation requiring the resistive layer to directly overlay the thin film resistor substrate is not met, and their rejection should be withdrawn on this basis.

Furthermore, claim 1 requires "attaching a chip resistor termination on each end of the metal resistive layer." Minami et al. is clearly directed towards a thermal head (title) and not a chip resistor. Therefore, Minami et al. cannot possibly teach attaching "a chip resistor termination." This rejection must be withdrawn, and claim 1 should be allowed.

Minami et al. is directed towards a thermal head, a very different type of device than the chip resistor of the present invention. In Minami et al., the resistors are designed to generate heat

for the thermal printing process so that the thermal recording medium pressed against the head results in printing (col. 1, lines 4-15). Because the device of Minami et al. is a thermal head, a glaze layer is used for pressing against the thermal recording medium (col. 1, lines 41-66).

The present invention does not use a glaze layer for such a purpose as it is directed towards manufacturing a chip resistor. The language of claim 1 explicitly precludes such a glaze layer on the substrate as claim 1 requires "directly overlaying and attaching" the metal film resistive layer to the substrate. Therefore this rejection should be withdrawn and the Examiner should find claim 1 allowable. As claims 2-5 depend from claim 1, the Examiner should find these claims allowable as well.

Claim 2 was rejected under 35 U.S.C. § 103(a) as unpatentable over Minami et al. and further in view of Young. Young does teach sputtering Ta₂O₅. However, as argued above, Minami does not teach the rest of the limitations and is directed towards a thermal head and not a chip resistor.

Claims 3-5 were rejected under 35 U.S.C. § 103(a) as unpatentable over Minami et al. and further in view of Oki Electric Ind. Co. Oki Electric does teach a resistance layer consisting of NiCr. However, as argued above, Minami does not teach the rest of the limitations and is directed towards a thermal head, and not a chip resistor.

Claim 15 was rejected under 35 U.S.C. § 103(a) as unpatentable over Fuyama et al. in view of Sato and Oki Electric. Fuyama et al. does teach a structure of substrate/glaze layer/heating resistor/SiO₂/Si₃N₄ or Ta₂O₅. Sato is just another example of a thermal head. Oki Electric teaches that resistance layers can be metals such as NiCr. However, claim 15 requires "attaching a chip resistor termination on each end of the metal film resistive layer." Fuyama et al. is directed toward a thermal head, not a chip resistor. Therefore, Fuyama et al. cannot possibly teach attaching "a chip resistor termination." Thus, this rejection should be withdrawn and the Examiner should find claim 15 allowable.

Furthermore, claim 15 requires "depositing a non-tantalum metal film resistive layer directly overlaying and attaching to a substrate." Fuyama et al. teaches a glaze layer between the substrate and the heating resistor. The resistive layer in Fuyama et al. does not directly overlay and attach to the substrate. Fuyama et al., even in combination with Sato and Oki Electric, does not teach the claimed structure.

Given the different context of the prior art cited by the Examiner and the Applicant's claimed invention, there is no paper motivation or suggestion to use a layer of tantalum pentoxide outside of a thermal head where there is a glaze layer. Therefore, all claims are patentable over the prior art and should be allowed.

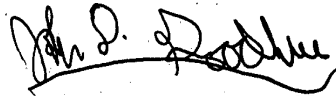
Conclusion

No fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Reconsideration and allowance is respectfully requested.

Respectfully submitted,



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**AMENDMENT — VERSION WITH MARKINGS
TO SHOW CHANGES MADE**

In the Claims

1. (Fourth Amended)

A method of manufacturing a thin film chip resistor with a moisture barrier comprising:
depositing a non-tantalum metal film resistive layer ~~on~~ directly overlaying and attaching to a thin
film chip resistor substrate;
attaching a ~~thin film~~ chip resistor termination on each end of the metal film resistive layer; and
depositing the moisture barrier comprising a layer of tantalum pentoxide film directly overlaying
and attaching to the metal film resistive layer to reduce failures due to electrolytic
corrosion under powered moisture conditions.

15. (Thrice Amended)

A method of manufacturing a thin film chip resistor with a moisture barrier comprising:
depositing a non-tantalum metal film resistive layer ~~on~~ directly overlaying and attaching to a
substrate;
attaching a chip resistor termination on each end of the metal film resistive layer;
depositing a passivation layer directly overlaying and attaching to the metal film layer; and
depositing the moisture barrier comprising a layer of tantalum pentoxide film directly overlaying
and attaching to the passivation layer for reducing failures due to electrolytic corrosion
under powered moisture conditions.